

**WHAT IS CLAIMED IS:**

1. A liquid crystal display comprising:  
a liquid crystal display panel for displaying picture images; and  
a color correction unit;

5 wherein upon receipt of raw RGB picture data corresponding to raw  
RGB gamma curves, the color correction unit generates corrected RGB picture  
data based on values over a predetermined imaginative gamma curve  
established in accordance with the characteristic of the liquid crystal display  
panel, stores values over corrected RGB gamma curves corresponding to the  
10 corrected picture data, and gamma-corrects the raw RGB picture data based on  
values over the stored corrected RGB gamma curves.

2. The liquid crystal display of claim 1 wherein the number of bits  
in the corrected picture data is altered through making bit extension with  
respect the raw picture data.

15 3. The liquid crystal display of claim 1 wherein the imaginative  
gamma curve is the G gamma curve adapted to the G picture data.

4. The liquid crystal display of claim 3 wherein the corrected  
gamma curves are approximated to the G gamma curve.

20 5. The liquid crystal display of claim 1 wherein the liquid crystal  
display panel makes the display in a VA mode.

6. The liquid crystal display of claim 1 wherein the liquid crystal  
display panel makes the display in a PVA mode.

7. A liquid crystal display comprising:

a vertically aligned mode liquid crystal display panel for displaying picture images; and

a color correction unit;

wherein upon receipt of raw RGB picture data corresponding to raw RGB gamma curves, the color correction unit transforms the raw RGB picture data into corrected RGB picture data based on values over a predetermined imaginative gamma curve established in accordance with the characteristic of the vertically aligned mode liquid crystal display panel, stores values over corrected RGB gamma curves corresponding to the transformed corrected picture data, and gamma-corrects the raw RGB picture data based on values over the stored corrected RGB gamma curves.

8. The liquid crystal display of claim 1 wherein the liquid crystal display panel makes the display in a VA mode.

9. The liquid crystal display of claim 1 wherein the liquid crystal display panel makes the display in a PVA mode.

10. The liquid crystal display of claim 7 wherein the corrected gamma curves intercept overlapping of the input picture data through gray scale extension.

11. A liquid crystal display comprising:

a liquid crystal display panel having an internal layer of liquid crystal with a predetermined property, a plurality of gate lines transmitting scanning signals, a plurality of data lines transmitting picture signals, and switching circuits connected to the gate and the data lines;

a scan driver sequentially applying gate on voltages for turning-on the switching circuits to the gate lines;

a data driver applying data voltages for representing picture signals to the data lines; and

5 a control unit, at initial driving, generating corrected picture data corresponding to raw RGB picture data fed from the outside while storing the corrected picture data into a predetermined memory, and after the initial driving, upon receipt of raw RGB picture data from the outside, extracting corrected picture data corresponding to the raw RGB picture data from the memory while  
10 transmitting the extracted picture data to the data driver, and generating timing signals for controlling the operation of the scan driver and the data driver while outputting the generated timing signals to the scan driver and the data driver, respectively.

12. The liquid crystal display of claim 11 wherein the control unit  
15 receives picture signals corresponding to respective RGB gamma curves from the outside, normalizes the RGB gamma curves into one gamma curve, and controls the gray scale levels of the picture signals input from the outside based on the normalized gamma curve.

13. The liquid crystal display of claim 11 wherein the control unit  
20 comprises:

a color correction unit, at initial driving, receives raw RGB picture data from an external graphic controller and transforms the raw RGB picture data into corrected picture data while storing the corrected picture data into the

memory, and after the initial driving, upon receipt of raw RGB picture data from the outside, extracting the corrected picture data corresponding to the raw RGB picture data from the memory and transforming the extracted picture data into multi-gray scales; and

5           a timing control unit outputting the transformed picture data to the data driver, and generating timing signals for controlling the operation of the scan driver and the data driver while outputting the generated timing signals to the scan driver and the data driver, respectively.

10           14.     The liquid crystal display of claim 11 wherein the control unit comprises:

          a timing control unit generating timing signals for controlling the operation of the scan driver and the data driver while outputting the generated timing signals to the scan driver and the data driver, and outputting the raw RGB picture data input from the outside; and

15           a color correction unit, at initial driving, receives raw RGB picture data from an external graphic controller and transforms the raw RGB picture data into corrected picture data while storing the corrected picture data into the memory, and after the initial driving, upon receipt of raw RGB picture data from the outside, extracting the corrected picture data corresponding to the raw RGB picture data from the memory and transforming the extracted picture data into multi-gray scales while outputting the transformed picture data to the data driver.

20           15.     The liquid crystal display of claim 13 or 14 wherein the color correction unit further makes a treatment of dithering.

16. The liquid crystal display of claim 13 or 14 wherein the color correction unit comprises:

a volatile memory;

a data controller, at initial driving, receiving raw RGB picture data from the outside and generating corrected picture data while storing the corrected picture data into the volatile memory, and after the initial driving, upon receipt of raw RGB picture data from the outside, outputting corrected picture data corresponding to the raw picture data from the volatile memory; and

an FRC unit transforming the corrected picture data into gray scale data, and outputting the gray scale data to the data driver.

17. The liquid crystal display of claim 16 wherein the color correction unit further comprises a memory control unit, the memory control unit storing values over an imaginative gamma curve corresponding to the characteristic of the liquid crystal display panel, and at initial driving, feeding gamma data corresponding to the values over the imaginative gamma curve to the volatile memory while controlling the storing.

18. The liquid crystal display of claim 17 wherein the memory control unit comprises:

a non-volatile memory storing the corrected picture data corresponding to the characteristic of the liquid crystal display panel; and

a memory controller, at initial driving, controlling the storing of the gamma data corresponding to the imaginative gamma curve into the non-volatile memory.

19. The liquid crystal display of claim 11 wherein the corrected picture data are generated based on a predetermined imaginative gamma curve.

20. The liquid crystal display of claim 11 wherein the bit number of the corrected picture data is the same as the bit number of the raw picture data.

21. The liquid crystal display of claim 11 wherein the corrected picture data are obtained through bit extension of the raw picture data.

22. The liquid crystal display of claim 13 or 14 wherein the multi-gray scale transformation is made through frame rate control FRC.

23. The liquid crystal display of claim 11 wherein the liquid crystal display panel makes the display in a VA mode.

24. The liquid crystal display of claim 11 wherein the liquid crystal display panel makes the display in a PVA mode.

25. A driving unit for a liquid crystal display, the liquid crystal display having a layer of liquid crystal with a predetermined property, a plurality of gate lines, a plurality of data lines crossing over the gate lines while being insulated from the gate lines, and pixels surrounded by the gate and data lines each with a switching circuit connected to the corresponding gate and the data lines, the pixels being arranged in a matrix form, the driving unit for the liquid crystal display comprising:

a scan driver sequentially applying gate on voltages for turning-on the switching circuits to the plurality of gate lines;

a data driver applying data voltages for representing picture signals to

the data lines; and

a control unit, at initial driving, generating corrected picture data corresponding to raw RGB picture data fed from the outside while storing the corrected picture data into a predetermined memory, and after the initial driving, upon receipt of raw RGB picture data from the outside, extracting corrected picture data corresponding to the raw RGB picture data from the memory while transmitting the extracted picture data to the data driver, and generating timing signals for controlling the operation of the scan driver and the data driver while outputting the generated timing signals to the scan driver and the data driver, respectively.

26. The driving unit for the liquid crystal display of claim 25 wherein the liquid crystal display panel makes the display in a VA mode.

27. The driving unit for the liquid crystal display of claim 25 wherein the liquid crystal display panel makes the display in a PVA mode.

28. A method of driving a liquid crystal display, the liquid crystal display having a layer of liquid crystal with a predetermined property, a plurality of gate lines, a plurality of data lines crossing over the gate lines while being insulated from the gate lines, and pixels surrounded by the gate and data lines each with a switching circuit connected to the corresponding gate and data lines, the pixels being arranged in a matrix form, the method comprising the steps of:

- (a) sequentially transmitting scanning signals to the gate lines;
- (b) upon receipt of RGB gray scale data for displaying picture images

from the outside, establishing RGB gammas based on the RGB gray scale data, and generating data voltages based on the established RGB gammas; and

(c) feeding the data voltages generated at the (b) step to the data lines.

29. The method of claim 28 wherein the (b) step comprises the sub-steps of:

(b-1) establishing a predetermined imaginative gamma curve;

(b-2) at initial driving, receiving raw RGB picture data adapted to RGB gamma curves from the outside, and detecting light transmissions corresponding to grays of the raw picture data over the imaginative gamma curve;

(b-3) detecting gray values of the raw picture data corresponding to the detected light transmissions from the relevant gamma curves; and

(b-4) transforming the gray values detected at the (b-3) step into a predetermined number of bits, and storing the bit-transformed gray values.

30. The method of claim 29 wherein the (b) step further comprises the sub-steps of:

(b-5) after the initial driving, receiving raw picture data adapted to a predetermined gamma curve from the outside, and detecting the stored bit-transformed gray values; and

(b-6) transforming the detected gray values into multi-gray scales, and generating data voltages for the data lines.

31. The method of claim 29 or 30 wherein the imaginative gamma curve is established to be optimally adapted to the characteristic of the liquid



crystal display panel.

32. The method of claim 29 or 30 wherein the imaginative gamma curve is one of the RGB gamma curves.

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